

ARGUMENT

To: Commissioner of the Patent Office

1. Identification of International Application
PCT/JP96/01472

2. Applicant

Name: MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

Address: 1006, Ohaza Kadoma, Kadoma-shi, Osaka 571
Japan

Country of nationality: Japan

Country of residence: Japan

3. Agent:

Name: 7828 YAMAMOTO Shusaku

Address: Fifteenth Floor, Crystal Tower, 2-27, Shiromi
1-chome, Chuo-ku, Osaka-shi, Osaka 540 Japan

4. Date of Notification:

March 18, 1997

5. Subject Matter of Argument

A. Applicant respectfully argues as follows to the opinion of the Examiner set forth in section V of the Written Opinion.

(1) The present invention recited in claim 1 (independent claim) has been judged as lacking novelty and an inventive step over Document 1 cited in the International Search Report.

However, Document 1 only discloses "performing an annealing process at a temperature sufficiently lower than the Curie temperature." Document 1 neither teaches or suggests, at all, "performing a low-temperature annealing at a low temperature (specifically, at 120°C or less as recited in claim 1)."

For example, Document 1 in paragraph 41 describes "an annealing process at a temperature sufficiently lower than the Curie temperature," and the specific annealing temperature is, for example, about 500°C in the case of LiTaO_3 , as described in line 4 of the paragraph. Note that the value "100°C" described in paragraph 3 of the paragraph is merely the temperature difference between the Curie temperature and the annealing temperature. The actual annealing temperature in Document 1 is set to a relatively high temperature as described above.

Thus, Document 1 neither teaches nor suggests the low-temperature annealing of the present invention recited in claim 1.

Moreover, in the present invention, such a low-temperature annealing process provides significant effects such as stabilization of a proton stabilized layer and, further, formation of a stable optical element, whereas Document 1 neither teaches nor suggests such effects.

Therefore, taking the above points into consideration, Applicant submits that the present invention recited in claim 1 should be considered as involving novelty and an inventive step over Document 1.

(2) The present invention recited in claim 13 (independent claim) has been judged as lacking novelty and an inventive step over Document 2 cited in the International Search Report.

In response to this, Applicant has made an amendment to incorporate the limitation of claim 14 (dependent claim) into claim 13 in the Amendment filed together with this Argument. As a result, Applicant submits that amended claim 13 has novelty and an inventive step over Document 2.

(3) The present invention recited in claim 35 (independent claim) has been judged as lacking an inventive step over the combination of Document 3 and Document 8 cited in the International Search Report.

However, the present invention recited in claim 35 uses an ultraviolet laser light source configured to be capable of radiating a modulated ultraviolet laser light, i.e., an ultraviolet laser light source which itself has a modulation function. This feature of the present invention realizes effects such as reduction of size or reduction of cost. On the other hand, in the configuration described in Document 8 (see, for example, Figure 1), a laser beam (20) emitted from a laser light source (13) is modulated by an optical modulator (21) after being subjected to wavelength conversion. That is, the modulation function for laser light is realized by a modulator provided separately from the laser light source.

Even if those skilled in the art were to combine Document 3 and Document 8, there is no motivation in the documents prompting them to modify the fundamental arrangement of the configuration disclosed in Figure 1 of Document 8. Therefore, in a configuration obtained from such a combination, the modulation function is effectuated upon laser light after it is emitted from the laser light source, but there would never be provided the configuration of the present invention as recited in claim 35 which includes a laser light source having a modulation function on its own.

Therefore, Applicant submits that the present invention recited in claim 35 (independent claim) should be considered patentable over the combination of Document 3 and Document 8.

(4) The present invention recited in claim 30 or 40 (both independent claims) has been judged as lacking an inventive step over the combination of Document 3 and Document 9 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has made an amendment to distinctly specify that "the semiconductor laser (included in a light source) is wavelength-locked" in each of claims 30 and 40. Such a configuration provides an effect that the wavelength of light emitted from the semiconductor laser is kept at a substantially constant level even when there occurs a change in the environmental temperature, or the like, thereby stably realizing generation of a higher harmonic wave by the optical wavelength conversion element (having domain inverted structures) using light emitted from the semiconductor laser as a fundamental wave.

However, Document 9 neither teaches nor suggests, at all, the necessity of stabilizing the wavelength of the emitted light by the wavelength locking of the semiconductor laser

as described above. Thus, even if those skilled in the art were to combine Document 3 and Document 9, they can never obtain the configuration of the present invention as recited in claim 30 or 40.

Therefore, Applicant submits that the present invention recited in claim 30 or 40 (both independent claims) should be considered patentable over the combination of Document 3 and Document 9.

(5) In the Amendment filed together with this Argument, Applicant has newly added claims 76 and 77 (both independent claims). These new claims recite a configuration employing "a semiconductor laser and a solid state laser crystal for receiving laser light emitted from the semiconductor laser" instead of "a wavelength-locked semiconductor laser" as in the above-described configuration recited in claim 30 or 40. In this configuration, light emitted from the solid state laser crystal is incident upon the optical wavelength conversion element as a fundamental wave, and is subjected to wavelength conversion whereby a higher harmonic wave is generated. At this point, even if the wavelength of the light emitted from the semiconductor laser is changed for some reason, the wavelength of light emitted from the solid state laser crystal is uniquely set at an oscillation wavelength which is determined depending upon the crystal material. Therefore, the same effect as in the present invention recited in claim 30 or 40 can be realized.

Applicant submits that the present invention recited in claim 76 or 77 (both independent claims) should also be considered patentable over the combination of Document 3 and Document 9 for the same reason set forth above with respect to the present invention recited in claim 30 or 40 (both independent claims).

(6) The present invention recited in claim 45 (independent claim) has been judged as lacking an inventive step over the combination of Document 10 and Document 11 cited in the International Search Report.

However, in the configuration recited in claim 45, when a optical path of light emitted from a sub-semiconductor laser is blocked for some reason, the radiation of laser light from the laser light source is terminated. Thus, the function as a safety device during operation of the device is realized. Such a configuration is clearly different from the "configuration which is driven so as to oscillate only when light is detected" suggested by Document 11.

Thus, even if those skilled in the art were to combine Document 10 and Document 11, they can never obtain the configuration of the present invention as recited in claim 45. Therefore, Applicant submits that the present invention recited in claim 45 should be considered patentable over the combination of Document 10 and Document 11.

(7) The present invention recited in claim 55 (independent claim) has been judged as lacking an inventive step over Document 12 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has amended claim 55 so as to distinctly recite that "respective split laser light is separately modulated." That is, in the aforementioned configuration of the present invention, the respective split laser light is separately modulated with separate signals so as to irradiate a screen while being superimposed by different modulation signals.

On the other hand, the configuration of Document 12 merely splits light emitted from a modulator 2. In such a configuration as that of Document 12, unlike the configura-

tion of the present invention, laser light is split after being modulated, whereby the respective split laser light merely irradiates the screen while being superimposed by the same modulation signal.

Thus, even if those skilled in the art were to refer to Document 12, they can never obtain the configuration of the present invention as recited in claim 45. Therefore, Applicant submits that the present invention recited in claim 55 should be considered patentable over Document 12.

(8) The present invention recited in claim 69 (independent claim) has been judged as lacking an inventive step over Document 6 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has amended claim 69 so as to more distinctly recite the configuration of the present invention. Specifically, in the present invention recited in claim 69, an optical pickup and a laser light source are provided separately from each other, where only the optical wavelength conversion element is provided in the optical pickup. This increases the freedom in positioning the semiconductor laser. For example, it is possible to release heat generated by the semiconductor laser through the frame of the optical disk apparatus. In this case, it is possible to use a high output semiconductor laser.

On the other hand, Document 6 merely connects a light source section to a secondary harmonic wave generation section with an optical fiber. It is not apparent from this configuration to provide an optical pickup and a laser light source separately from each other.

Thus, even if those skilled in the art were to refer to Document 6, they can never obtain the configuration of the present invention as recited in claim 69. Therefore,

Applicant submits that the present invention recited in claim 69 should be considered patentable over Document 6.

B. Applicant respectfully argues as follows to the opinion of the Examiner set forth in section VIII of the Written Opinion with respect to claims 1 to 9.

(9) "Formation of a proton exchange layer" according to the present invention recited in claims 1 to 9 relates to a proton exchange process for forming an optical waveguide. In the Amendment filed together with this Argument, Applicant has amended the pertinent claims so as to distinctly recite this point.

A high-temperature annealing process is recited in claim 4. Note, however, that Applicant has amended claim 4 in the Amendment so as to have more distinct recitations.